

THERAPEUTIC EXPERTISE



THERAPEUTIC EXPERTISE: TABLE OF CONTENTS

■ THERAPEUTIC EXPERTISE

OVERVIEW.....	1
INDICATIONS.....	2-8
• Dermatology.....	2
• Cardiovascular.....	2
• Infectious Diseases/Vaccine.....	3
• Nephrology.....	3
• Neuroscience.....	4
• Oncology.....	5
• Ophthalmology.....	6
• Pain.....	7
• Rheumatology.....	7
• Women’s Health.....	8
CLINICAL DEVELOPMENT.....	9-11
• Biosimilars.....	9
• Cell, Gene, and Tissue Therapies.....	9
• Combination Products.....	10
• Drug-Delivery Systems.....	10
• Generics.....	10
• Pediatrics.....	11
• Small Molecule Therapeutics.....	11
• Therapeutic Proteins.....	11



THERAPEUTIC EXPERTISE: OVERVIEW

APPLIED KNOWLEDGE. INTELLIGENT SOLUTIONS.

As one of the first CROs to establish dedicated therapeutic teams, we have specialized resources with the necessary operational and therapeutic expertise to conduct clinical programs in key therapeutic areas. By concentrating the attention of experienced medical and scientific professionals in specific areas, we have gained a depth of knowledge, which has allowed us to apply new insights and innovative science to clinical trials. PharmaNet's therapeutically focused teams include experienced medical monitors, project managers, clinical research associates, data management professionals, biostatisticians, and medical writers.

From small to large programs in a clinical environment or laboratory, our therapeutic expertise is just one more reason why *PharmaNet works for you.*

Therapeutic Indications	Clinical Development Expertise
<ul style="list-style-type: none">• Cardiovascular• Dermatology• Infectious Diseases/Vaccines• Nephrology• Neuroscience• Oncology• Ophthalmology• Pain• Rheumatology• Women's Health	<ul style="list-style-type: none">• Biosimilars• Cell, Gene, Tissue Therapies• Combination Products• Drug Delivery Systems• Generics• Pediatrics• Small Molecule Therapeutics• Therapeutic Proteins

THERAPEUTIC EXPERTISE: INDICATIONS

DERMATOLOGY

The PharmaNet dermatology team is made up of clinicians and clinical research associates with extensive experience in dermatological studies. In hundreds of dermatologic trials involving tens of thousands of patients, PharmaNet's dermatology team has studied topical, systemic, transdermal, transmucosal, inhaled, antibacterial, anti-fungal, anti-inflammatory, anti-viral, dry skin, and wound care products.

In addition to extensive ties with a global network of leading dermatological investigators, we are thoroughly familiar with both the objective and subjective ratings used to evaluate dermatological study results, including lesion counts and skin changes, such as color, roughness, moisture content, and elasticity. Our extensive experience in products for skin and skin-structure infections includes NDA, ANDA, and 505(b)(2) submissions; GMP, GLP, and cGCP audits; and regulatory liaison.

CARDIOVASCULAR

Because cardiovascular diseases claim millions of lives around the world each year, new and innovative therapies are in high demand. PharmaNet's dedicated cardiovascular team offers expertise in all stages of program design and development. In late-stage, PharmaNet's cardiovascular team offers extensive clinical trials experience, expanded access programs, patient registries, and global safety and pharmacovigilance.

Our established relationships with many of the world's leading cardiovascular centers and specialists enable access to a large network of investigators and patient populations so that even large, multi-center global trials can be conducted effectively and on time. For clinical trials studying acute coronary syndromes, thrombosis, pulmonary hypertension, arrhythmia, diabetes, heart failure, hypercholesterolemia, and many other conditions, *PharmaNet works for you.*

THERAPEUTIC EXPERTISE: INDICATIONS

INFECTIOUS DISEASES/VACCINES

PharmaNet experts in infectious disease and vaccine clinical trials offer a broad range of therapeutic expertise in bacteriology, virology, mycology, and associated diseases and syndromes. We have a proven record of success with all forms of regulated anti-infective and immunologic agents, including drugs, biologics, and devices. We have significant experience with all commonly studied populations, including pediatric, as well as with populations with unique clinical issues such as HIV infection, stem cell transplantation, chronic hepatitis, multidrug resistance, sepsis/septic shock, and trauma.

To ensure the success of your vaccine study, our flexible monitor resourcing plans address short or lengthy follow-up recruitment periods. We have expertise in a variety of therapeutic indications for all age groups, including HIV and HPV infections, meningitis, pneumococcus, influenza, and therapeutic vaccines. PharmaNet's immunology monitoring service offers multiplexed flow-cytometry to provide assays with up to fifteen different parameters, working with both fresh and preserved blood specimens. We can also perform immunology assays simultaneously, analyzing multiple immune response measurements to provide a broad and more sophisticated evaluation of patient response to the vaccine.

NEPHROLOGY

Chronic Kidney Disease (CKD) devastates millions of lives every year. The board-certified nephrologists and other specialists that make up the PharmaNet nephrology team have significant hands-on experience, including studies of factors influencing the morbidity and mortality of patients on hemodialysis, studies of treatments for hypertension, and investigations into patients with glomerulonephritis, diabetes, hypertension, and other nephropathic conditions.

Our strong clinical relationships with leading nephrology centers and specialists mean PharmaNet's nephrology team has access to specialized patient populations, including renal transplants, ESRD and pre-ESRD, and patients on hemodialysis and peritoneal dialysis.

THERAPEUTIC EXPERTISE: INDICATIONS

NEUROSCIENCE

With significant unmet medical needs in the treatment of Alzheimer's disease, cognitive disorders, stroke, multiple sclerosis, Parkinson's disease, seizure disorder, schizophrenia, and other major neuroscience disorders, the demand for innovative therapies is high and expected to grow. PharmaNet's neuroscience team is led by board-certified physicians, neurologists, and other neuroscience-experienced clinicians.

By maintaining strong relationships with leading psychiatrists, neurologists, and neuroscience investigators worldwide, PharmaNet has conducted more than 150 neuroscience trials from Phase I through Phase IV programs, from single-site Phase I studies to large, global programs.

We hold specific knowledge in the development of neurological therapeutics, including:

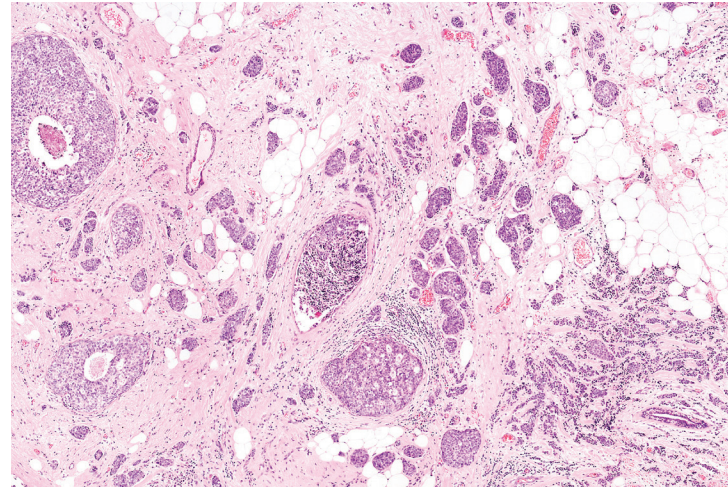
- Acute and chronic pain
- Addiction
- Alcohol addiction
- ALS
- Alzheimer's disease
- Anxiety
- Bipolar disorder
- Depression
- Eating disorders
- Epilepsy
- Fibromyalgia
- Migraine
- Multiple sclerosis
- Neurology
- Pain management
- Parkinson's disease
- Peripheral neuropathy
- Schizophrenia
- Sleep disorders

THERAPEUTIC EXPERTISE: INDICATIONS

ONCOLOGY

PharmaNet's strong global oncology project teams have conducted hundreds of regional and global oncology trials involving tens of thousands of patients and many different classes of therapeutics, including cytotoxic chemotherapies, monoclonal antibodies, targeted therapeutics, immunotherapies, pathway inhibitors, and therapeutic vaccines.

We have successfully conducted programs in all stages of development, including eleven registration programs that resulted in five NDA/MAA approvals. PharmaNet has extensive experience in First-in-Man (FIM) through Expanded Access Protocols (EAPs) in most solid tumor types including breast, lung, prostate, NHL, and colorectal and hematological malignancies (such as multiple myeloma and leukemias). Project sizes range from regional to large, global programs.



THERAPEUTIC EXPERTISE: INDICATIONS

OPHTHALMOLOGY

PharmaNet's ophthalmology team comprises ophthalmic experienced clinicians and other team members providing expertise in all key areas, including the objective evaluation of examinations and procedures to assess visual acuity, intraocular pressure, automated perimetry, biomicroscopy, ophthalmoscopy, and other eye care tests. Our ophthalmology professionals are also well-versed in the requirements of ophthalmic product development programs and provide current knowledge of competitive compounds, therapeutic practices, protocols, and case report forms.

In addition to evaluating data submitted by study staff, the team offers expertise in managing independent vendors that provide certification, such as certifying visual acuity examiners. They can also act as reading centers to certify fundus photographers, fluorescein angiographers, and optical coherence tomography (OCT) technicians.

PharmaNet's ophthalmology team has strong relationships with more than 500 investigator sites and a large pool of appropriate study participants in addition to experience on hundreds of ophthalmology studies involving ethical pharmaceuticals, devices, and over-the-counter products.

A partial list of studies the division has participated in:

- Ethical Pharmaceuticals
 - Aldose reductase inhibitors
 - Alpha-blockers
 - Anti-angiogenics
 - Antibacterials
 - Anti-cataract medications
 - Beta-blockers
 - Carbonic anhydrase inhibitors
 - Cycloplegics
 - Immunosuppressants
 - Mast cell stabilizers
 - Monoclonal antibodies
 - Mydriatics
 - NSAIDs
 - Prostaglandins
 - Retinoids
 - Steroids
 - VEGF inhibitors
- Devices
 - Contact lenses
 - Intraocular lenses
 - Lasers
 - Ocular implants lubricants
 - Punctal plugs
 - Silicone oils
 - Viscoelastics
- OTC Products
 - Anti-infectives
 - Artificial tears
 - Contact lens care products
 - Lubricants

THERAPEUTIC EXPERTISE: INDICATIONS

PAIN

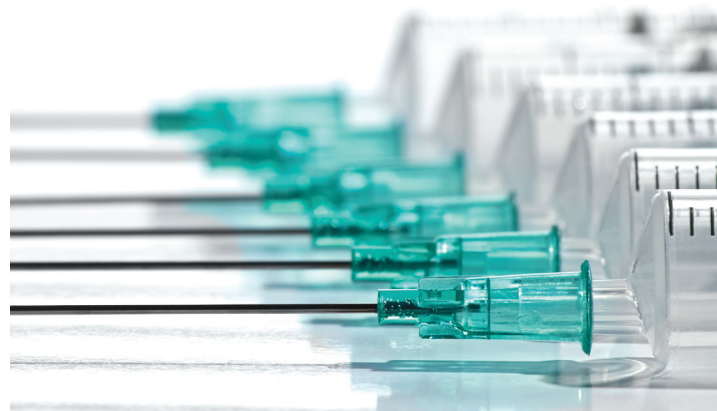
PharmaNet's team of pain management specialists conduct a wide variety of analgesic-related studies for small and large molecule targeted at post-surgical pain, neuropathy, cancer pain, headaches, dermal and laser procedure, migraine, osteoarthritis, and back pain.

Specialized project teams are familiar with pain measurement scales, including headache records, and likert, visual analog, and pediatric scales, and observer scoring.

RHEUMATOLOGY

PharmaNet's rheumatology team has extensive experience in standard scales for osteoarthritis and in developing treatment options for osteoarthritis, rheumatoid arthritis, osteoporosis, and undifferentiated connective tissue disease. PharmaNet has conducted 36 arthritis trials, studying close to 25,000 subjects at approximately 2,500 sites in the treatment of rheumatoid arthritis and osteoarthritis. Studies have included a variety of treatments administered orally or via injection (intra-articular, subcutaneous, and intravenous).

PharmaNet's large network of experienced investigators provides timely recruitment for rheumatology studies on a global basis.



THERAPEUTIC EXPERTISE: INDICATIONS

WOMEN'S HEALTH

In many different areas of health and medicine, women's needs are wholly different from men's. But just knowing the gender differences in disease patterns is not enough to do breakthrough research — firsthand experience in running these unique trials is vitally important. PharmaNet offers a dedicated team of professionals focused solely on the clinical investigation of pharmaceuticals, biologicals, and medical devices that hold promise for improving women's health.

Expertise includes:

- Breast carcinoma
- Breast implantation
- Contraception
- Fertility
- Gynecological infections
- Gynecological malignancies
- Hormonal therapies
- *In vitro* fertilization
- Menstrual disorders
- Osteoporosis
- Pregnancy and labor
- Sexual dysfunction
- Urinary incontinence
- Uterine disorders

THERAPEUTIC EXPERTISE: CLINICAL DEVELOPMENT

BIOSIMILARS

The U.S. Food and Drug Administration is exploring new regulatory pathways for the development of generic versions of biologics, also known as biosimilars. Although many factors impacting the regulatory pathway in the U.S. are still being assessed and evaluated, Europe and Asia have defined pathways in place.

The nature of biologics means biosimilar development requires a specific skill set, including immunochemistry expertise, clinical development experience with biologics, pharmacovigilance capabilities, regulatory relationships and expertise, and a thorough understanding of existing generic drug development approaches. PharmaNet excels in all of these areas.

In addition to providing insight into global requirements, PharmaNet consulting professionals include former senior-level FDA officials at the Center for Drug Evaluation and Research (CDER) and Center for Biologics Evaluation and Research (CBER) who offer unique insight into the development of new biosimilars.

CELL, GENE, AND TISSUE THERAPIES

Cell, gene, and tissue therapies offer unprecedented opportunities to both biotechnology companies and life science investors. PharmaNet consulting professionals provide expert guidance on predicting commercial feasibility, complying with GMP guidelines and evolving regulatory requirements, controlling biomaterial sources, and analyzing key issues in business opportunities.

PharmaNet's pharmaceutical and regulatory consulting team includes senior-level expertise from the Office of Tissue, Cell/Gene Therapy (OTCGT). Our consulting services provide assistance with study design, regulatory strategy, Chemistry/Manufacturing Control (CMC) issues, assessment of long-term risks, and interpreting actions and policies of worldwide regulatory agencies.

THERAPEUTIC EXPERTISE: CLINICAL DEVELOPMENT

COMBINATION PRODUCTS

The challenges involved in the development, manufacture, and regulation of combination products can be exponentially more difficult than those faced by the drug or device alone. PharmaNet professionals can assist in their development, having been involved in designing and conducting clinical trials for drug-device and drug-drug combination products, assisting with manufacturing issues, preparing and submitting marketing applications for these products, and helping to develop the approach taken by international regulatory agencies to combination product jurisdiction, regulation, and technical/clinical evaluation.

DRUG-DELIVERY SYSTEMS

PharmaNet's professionals offer significant experience in designing and conducting clinical studies for drug-delivery systems, as well as providing regulatory and technical consultation in preparing and submitting regulatory documents for these products. Delivery system categories in which PharmaNet has assisted sponsors include oral, inhalation, transdermal, needle-free injection, catheter, and implantable.

GENERICS

PharmaNet offers a comprehensive range of services, advanced facilities and equipment, and highly-trained personnel for conducting bioequivalence studies across a broad spectrum of therapeutic areas. During more than a decade of providing these services, PharmaNet has developed a deep understanding of the unique requirements of generics, including utilizing the 505(b)(2) pathway, as well as strong relationships with international regulatory agencies such as FDA, EMEA, HPFB, ANVISA, and TGA.

THERAPEUTIC EXPERTISE: CLINICAL DEVELOPMENT

PEDIATRICS

Studies in infants, children, and adolescents require special expertise in a wide variety of areas. In addition to regulatory advice on the FDA's Modernization Act (FDAMA), Pediatric Rule, US Pediatric Research Equity Act, the Best Pharmaceuticals for Children Act (the FDA's Amendment Act or FDAAA), and the EU Regulation on Medicinal Products for Paediatric Use, we provide medical oversight of active clinical trials, with special attention given to patient eligibility and monitoring of efficacy and safety in pediatric populations, age-specific informed consent and assent issues, and age-appropriate chemical formulations. Many of our clinical research associates have experiences with pediatric clinical trials.

PharmaNet's experienced professionals can provide input into study reports and regulatory filings, including interpretation of age-dependent laboratory and other data. We have proven methodologies to enhance enrollment, consistent with applicable ethical and age-based standards.

Our database of pediatric investigators, including investigators affiliated with Pediatric Pharmacology Research Units, allows us to quickly fill and complete pediatric trial programs in the Americas, Europe, and Asia-Pacific regions.

SMALL MOLECULE THERAPEUTICS

Well-planned regulatory strategies—including Chemistry/Manufacturing Controls (CMC), pharmacological, and toxicological studies—are critical for drug development programs. PharmaNet pharmaceutical and regulatory consulting experts include former senior-level officials with both the FDA Center for Drug Evaluation and Research (CDER) and international agencies. These professionals understand the unique issues related to small molecule drugs and can assist you with regulatory strategy, CMC preparation, clinical trial design issues, and other technical considerations to gain marketing approval for your products.

THERAPEUTIC PROTEINS

PharmaNet consulting professionals can assist you with many aspects of developing therapeutic proteins, monoclonal antibodies, and biosimilar products. PharmaNet pharmaceutical and regulatory consultants call on their experience as senior-level FDA officials to offer advice on every stage of the regulatory process, from planning a Biologics License Application (BLA) to establishing a post-marketing registry to track product safety.

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Phase I-IV

Bioanalytical

Bioequivalence

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Consulting